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# Left Ventricular Perforation During Ventriculogram Using an Optitorque Tiger Catheter

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A 76-year-old woman underwent left heart catheterization and coronary angiography for a non-ST-segment elevation myocardial infarction. A transradial approach with an Optitorque Tiger (Terumo, Somerset, New Jersey) catheter was used. Angiography was significant for only moderate nonobstructive disease in the right coronary artery. The Tiger catheter crossed the aortic valve and was used to obtain left heart pressures. After the pressure waveform and a small test injection appeared to show adequate positioning, a planned injection of 30 ml of contrast delivered over 10 s was begun. The patient developed chest discomfort and contrast appeared to dissect through the anterolateral wall and entered the pericardium (Online Video 1, **Figures 1 and 2**). The injection was promptly stopped and the catheter withdrawn. Approximately 4 ml of contrast were delivered. Post-injection myocardial staining and the presence of dye in the pericardium were noted (Online Video 2, **Figures 3 and 4**). She was hemodynamically stable and monitored uneventfully in the catheterization laboratory for 30 min after a transthoracic echocardiogram showed a small effusion and no signs of tamponade. Shortly after transfer to the

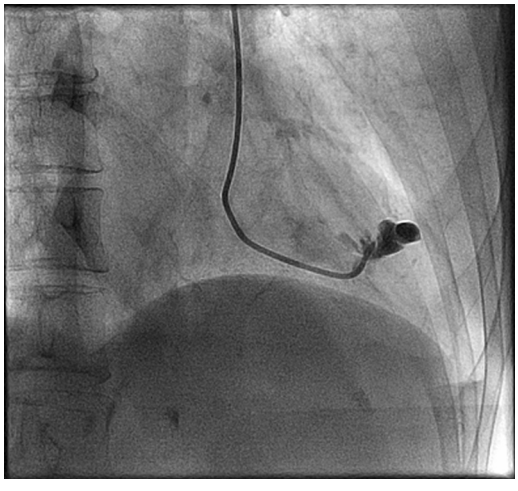

**FIGURE 1 Intramyocardial Extravasation**

Early still-frame image showing the dye dissecting through the anterolateral myocardium. See Online Video 1.

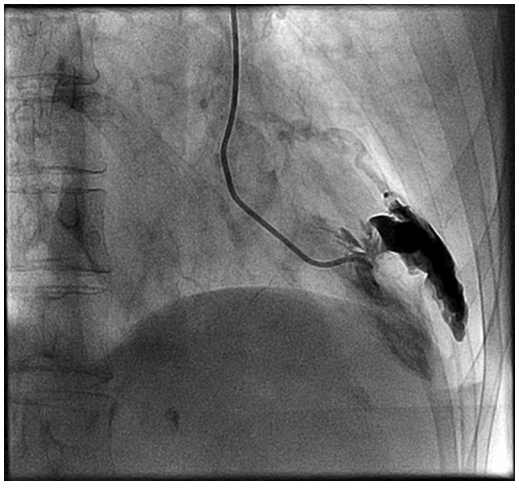

**FIGURE 2 Dye Entering Pericardium**

The tract of dye through the myocardium can be seen, and the dye appears to enter the pericardium. See Online Video 1.

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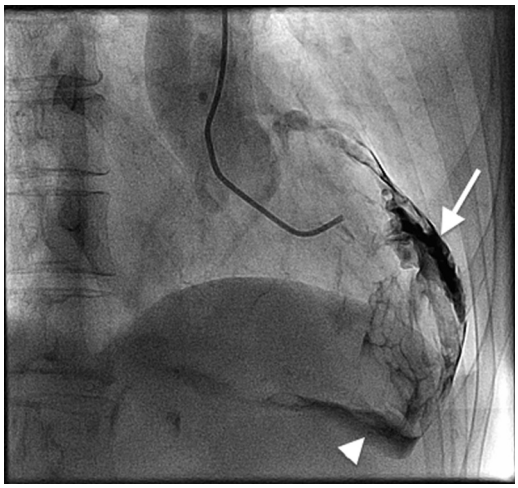

**FIGURE 3 Dye Extent on Cessation**

Still-frame image as the catheter begins to be retracted, showing dark myocardial staining **(arrow)** and dye in the pericardium **(arrowhead)**. See Online Video 2.

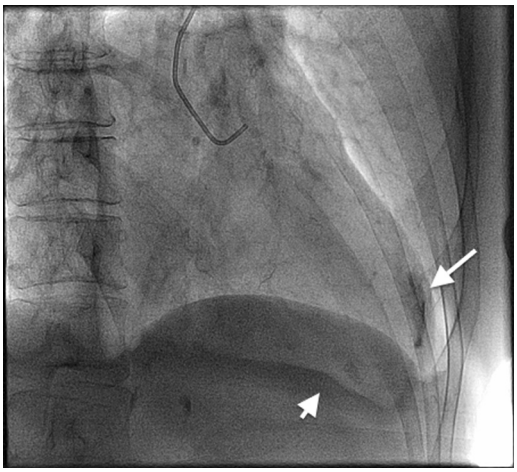

**FIGURE 4 Residual Myocardial Staining Post-Injection**

Still-frame image after aborted left ventriculography, showing continued staining of the myocardium **(arrow)** and pericardial dye **(arrowhead)**. See Online Video 2.

cardiac floor, she decompensated and underwent emergent pericardiocentesis. Nearly 250 ml of frank blood were drained. The patient subsequently had an uneventful recovery.

Transradial catheters, such as the Optitorque Jacky and Tiger shapes, have the promise of being "multipurpose" catheters for obtaining left and right coronary angiography as well as left ventriculography (1). Ours is not the first report of complications during ventriculography using such catheters (2). We hypothesize that while the end hole was directly juxtaposed against the endocardium, the side hole allowed for adequate transmission of pressure waveforms and the appearance of safe position during the test injection. Although perforation is a rare but well-recognized complication of left heart catheterization (3), the growing use of transradial catheterization leads to an insufficient literature documenting complications with transradial-specific catheters.

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**KEY WORDS** complications of catheterization, transradial access, ventricular perforation, ventriculography

**APPENDIX** For accompanying videos, please see the online version of this article.